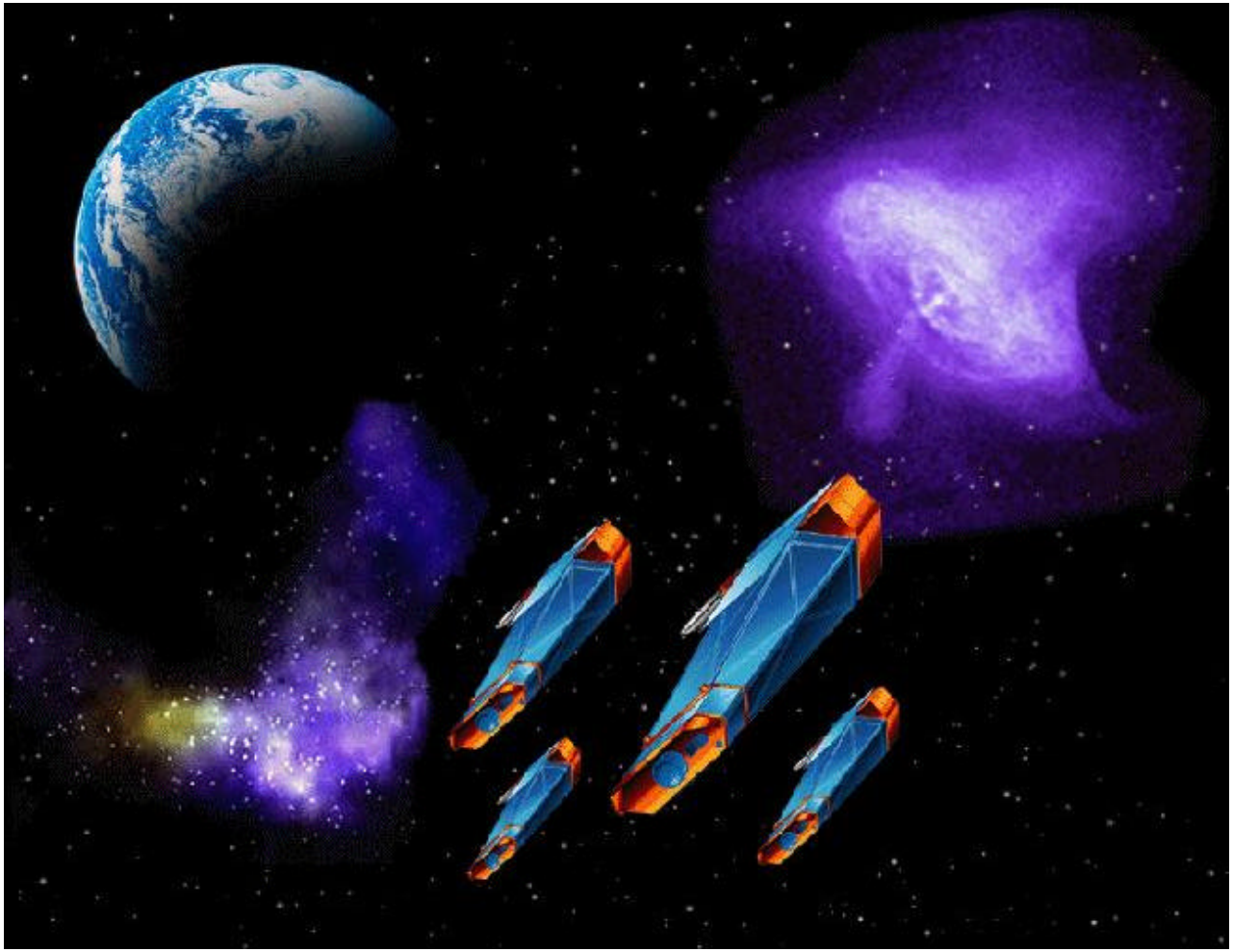
Constellation-X SXT optics tasks at MSFC



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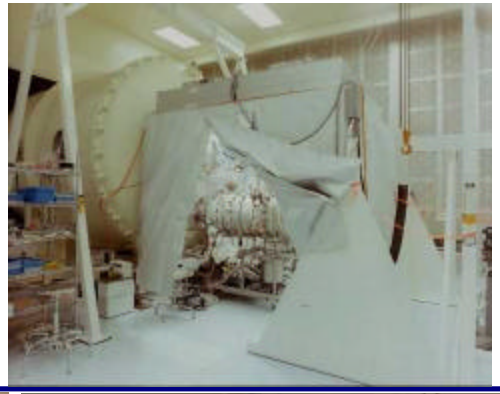
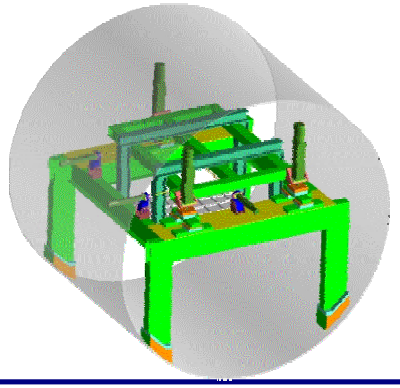
MSFC FY2004 SXT optics tasks

- **X-ray test optics.**
  - Perform x-ray testing in MSFC 100-m facility.
    - Have completed 6-DOF optics mount and preparations for x-ray testing.
    - Are completing rehearsal (“dry run”) with OAP 2 unit.
    - Will perform x-ray testing and analysis of development units.
- **Support segmented-mirror replication experiments at GSFC.**
  - Process 0.5-m cylindrical metal mandrels made by Zeiss.
    - Are re-processing (cleaning and gold coating) mandrel 50Z1 to GSFC.
    - Will continue re-processing 50Z1, then 50Z2 for final mirrors for EU.
- **Procure and accept meter-class precision segment mandrels.**
  - Procure Zerodur™ segment mandrels for GSFC mirror development.
    - Have received all segment mandrels (Type A, B & C) from Zeiss.
  - Conduct acceptance inspection and metrology on received mandrels.
    - Completed metrology mount and modifications for segment mandrels.
    - Performed coordinate, long-trace, surface-texture metrology on mandrel A.
    - Analysis of mandrel A metrology ongoing; mandrels B & C in queue

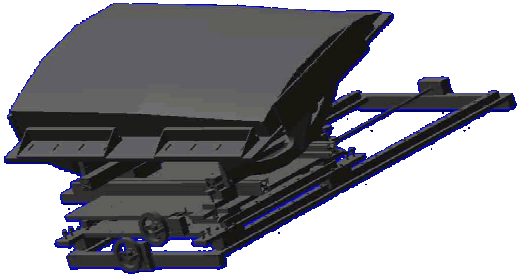
Support for SXT development

X-RAY TESTING

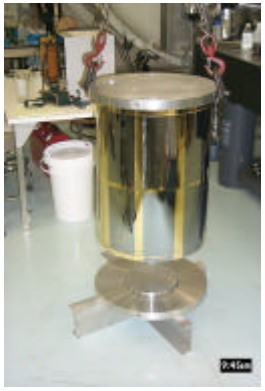


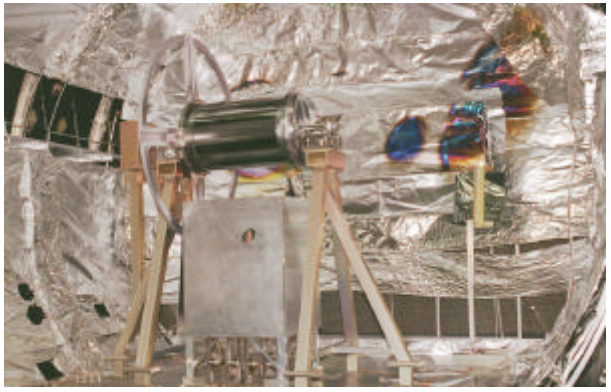


MANDREL METROLOGY



CLEANING & COATING

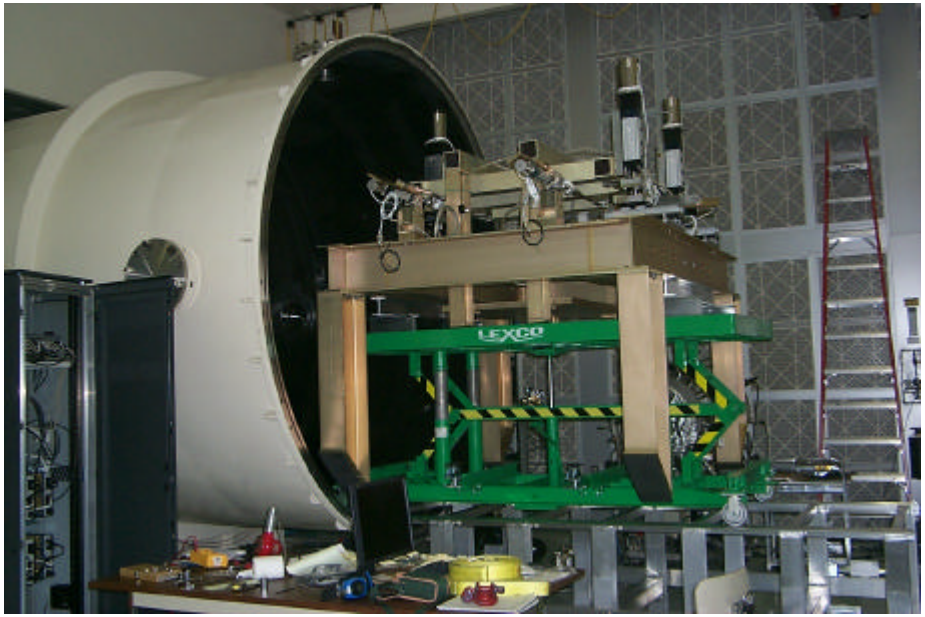


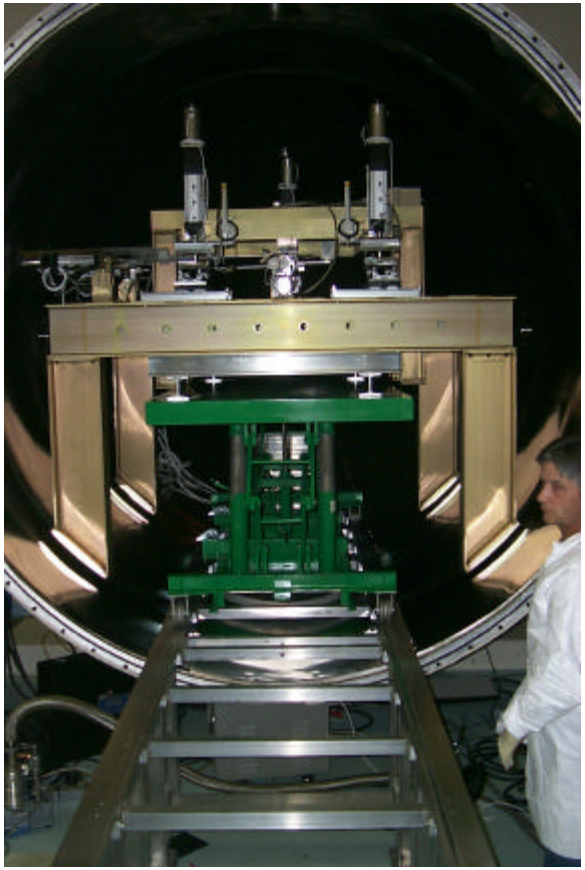


❑ OAP 2 Rehearsal.

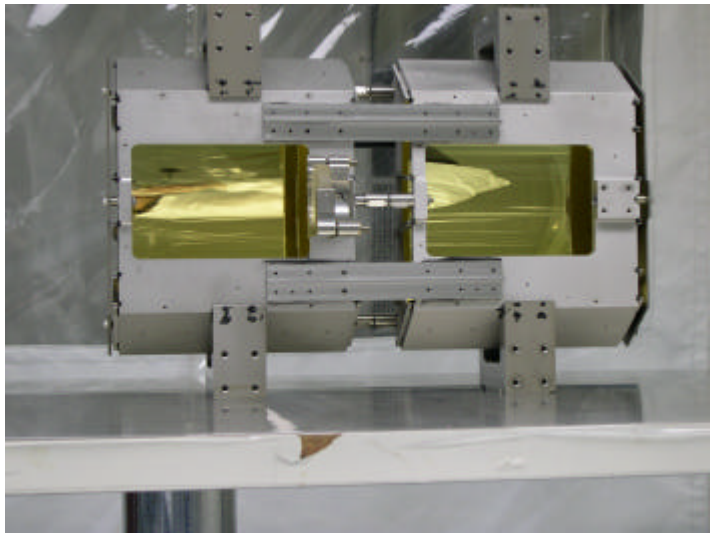
- End-to-end system checkout
  - Stray Light Facility (SLF)
  - X-ray sources
  - 6 Degree-of-Freedom (6-DoF) optics mount
  - X-ray detector (2048 x 2048 cooled CCD)
  - Optic and thermal control enclosure
  - Test procedures
- Generally successful checkout
  - 6-DoF mount, thermal enclosure operated in vacuum
  - CCD operated with no evidence of electrical interference between 6-DoF motors and thermal enclosure heaters
  - No light leaks in facility (would “fog” CCD images)
- Identified improvements
  - Brakes for 6-DoF mount actuator motors
  - Improved software for 6-DoF mount

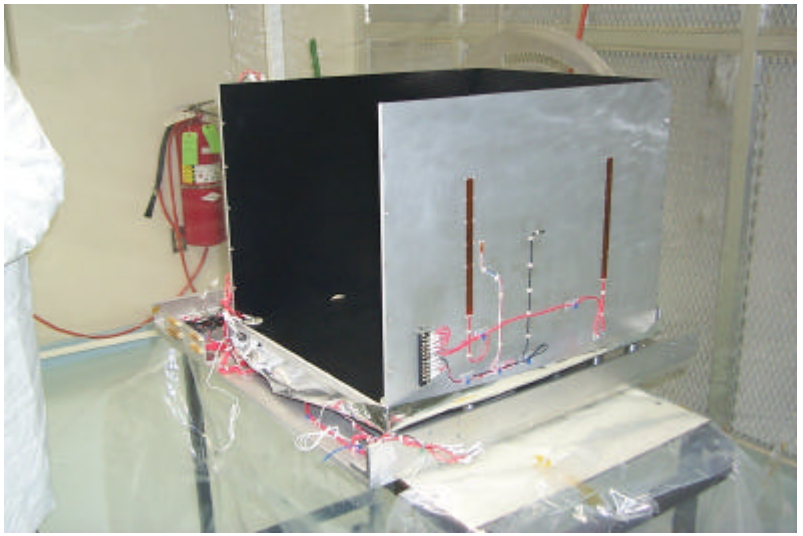
Loading 6 Degree-of-Freedom Mount into SLF

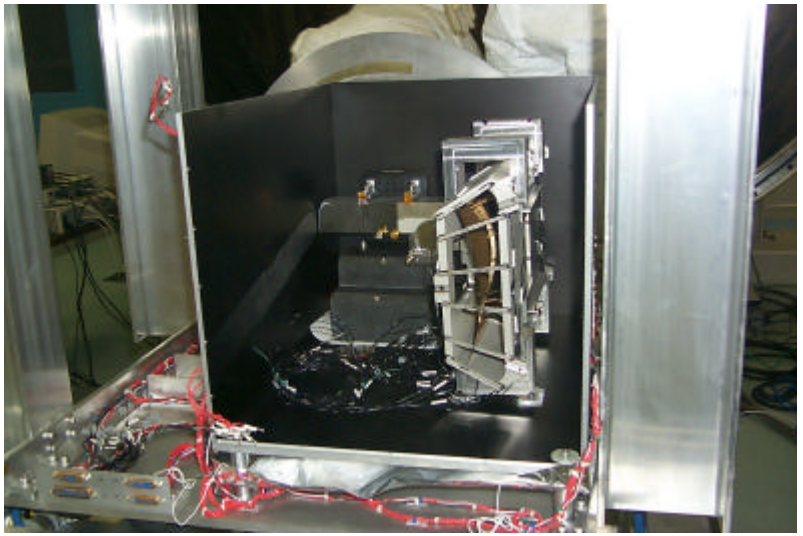




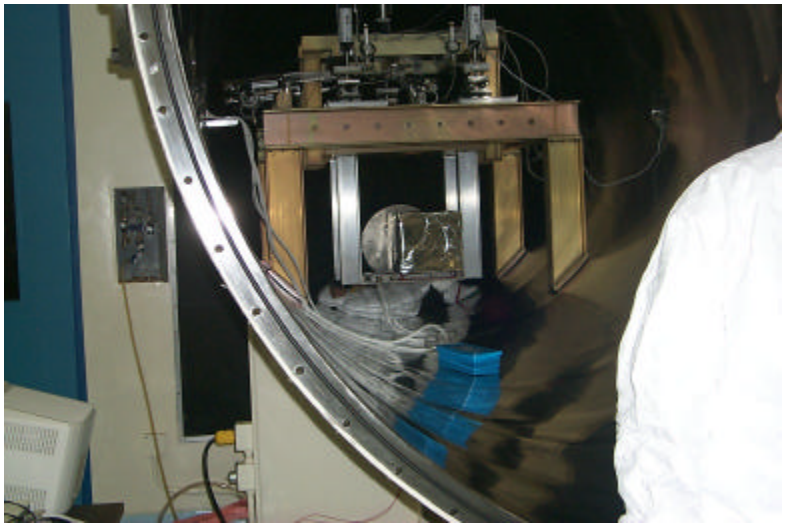
OAP 2 & Thermal Enclosure Preparation

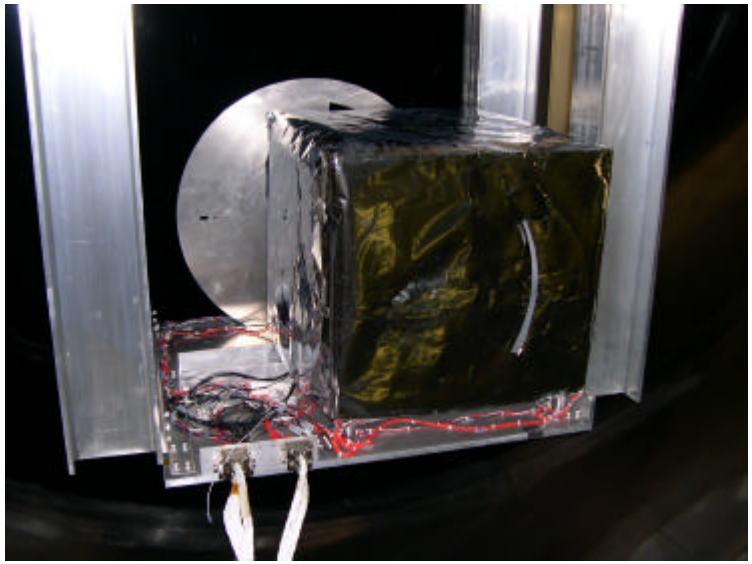


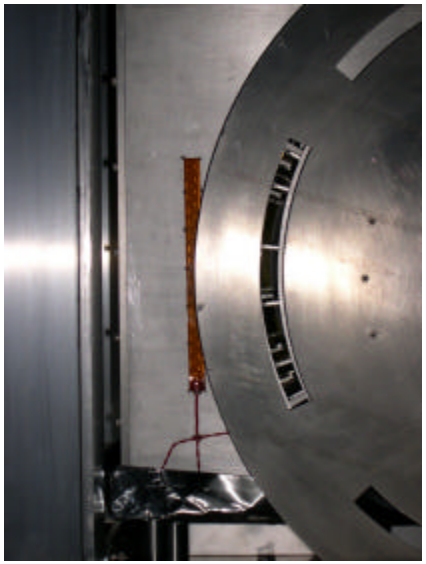




OAP 2 & Thermal Enclosure in SLF







X-ray Source & CCD Detector